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A NEW *VEXILLUM* OF THE SUBGENUS *PUSIA* (GASTROPODA: VEXILLIDAE) FROM THE BAHAMAS

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ABSTRACT

Vexillum (Pusia) chickcharneorum, new species, is described from three Bahamian Islands, and is compared with other similar Caribbean *Pusia*. A summary of proposed names for Caribbean *Pusia* is presented, with additional comments on several species.

Western Atlantic species of the genus *Vexillum* Röding, 1798, are divided among the subgenera *Costellaria* Swainson, 1840 and *Pusia* Swainson, 1840, all species of *Vexillum s.s.* being confined to the Indo-Pacific region. *Costellaria* species bury in mud and sand, whereas *Pusia* species inhabit rubble, coral reefs, and the undersides of stones (Cernohorsky, 1970). Specimens of an apparently unnamed species of *Pusia* were collected by one of us (WGL) at Great Exuma and Cat Island, Bahamas, during 1974 and 1976, and additional material from Great Abaco was provided by Mr. Colin Redfern. We were initially reluctant to believe that a locally common and distinctive species from shallow Bahamian reefs might be undescribed, but the following review revealed no suitable previous names.

Vexillum (Pusia) dermestinum (Lamarck, 1811) was the only *Pusia* known from the tropical western Atlantic until five additional species were described by Reeve (1844–45). In the period since Reeve's monograph, at least 18 more names have been proposed for western Atlantic *Pusia* by C. B. Adams (1845; 1850), Mörch (1852), Dohrn (1862), Sowerby (1874), Melvill (1925), Aguayo and Rehder (1936), Rehder (1943), McGinty (1955), Nowell-Usticke (1959; 1968), and Sarasua (1975).

Additionally, several erroneous names have been used for western Atlantic *Pusia*. *Voluta* [= *Vexillum (Pusia)*] *sulcata* Gmelin, 1791 (p. 3465) was long applied to the Caribbean species now known as *Vexillum (Pusia) albocinctum* (C. B. Adams, 1845), but the former name is a homonym of *Voluta sulcata* Gmelin, 1791 (p. 3455) (Cernohorsky, personal communication), and in any event was erected for the similar Indo-Pacific species properly known as *Vexillum (Pusia) microzonias* (Lamarck, 1811), the type species of *Pusia* (Cernohorsky, 1970). Mörch (1852) improperly listed *microzonias* and *V. (P.) cavea* (Reeve, 1844) among Antillean species, followed soon thereafter by Krebs (1864), who included *V. (P.) semicostatum* (Anton, 1839) in his list of West Indian species; the last two are also properly Indo-Pacific species. Dall (1889) tentatively listed *semicostatum* and also included *cavea*, *V. (P.) ebenus* (Lamarck, 1811) and *V. (P.) speciosa* (Reeve, 1844) from the western Atlantic, but *ebenus* is an eastern Atlantic species and *speciosa* belongs to the Indo-Pacific fauna.

Cernohorsky (1970) combined 18 primary names and supposed synonyms into six "biospecies" (pp. 3, 5) of western Atlantic *Pusia* (Table 1), based upon comparable variation he had noted in Indo-Pacific material; he did not include *V. (P.) cubanum* Aguayo and Rehder, 1936, and *V. (P.) arestum* Rehder, 1943. In addition, he designated *V. (P.) variatum* (Reeve, 1845) a synonym of the Indo-Pacific *V. (P.) unifascialis* (Lamarck, 1811), but *variatum* properly belongs to the Caribbean fauna (Abbott, 1974; Cernohorsky, personal communication). Although Abbott recognized Cernohorsky's revision, he listed nine western Atlantic species within the subgenus *Pusia*, excluding *V. (P.) epiphaneum* which he included in *Costellaria*. Nowell-Usticke (1968) named *Mitra minutus* and *M. hanleyi* form *antiguensis* from

Table 1. Primary "biospecies" and supposed synonyms of western Atlantic *Vexillum*, subgenus *Pusia*, as combined by Cernohorsky (1970)

1. *dermestinum* (Lamarck, 1811)	3. *epiphaneum* (Rehder, 1943)
albicostatum (C. B. Adams, 1850)	4. *histrio* (Reeve, 1844)
2. *exiguum* (C. B. Adams, 1845)	*articulatum* (Reeve, 1845)
hanleyi (Dohrn, 1862)	*albocinctum* (C. B. Adams, 1845)
gemmatum (Sowerby, 1874)	*bifasciatum* (Mörch, 1852)
roseocaudatum (Sowerby, 1874)	*cruzanum* (Nowell-Usticke, 1959)
sykesi (Melvill, 1925)	5. *puella* (Reeve, 1845)
moisei (McGinty, 1955)	*albomaculatum* (Sowerby, 1874)
hayesae (Nowell-Usticke, 1959)	6. *pulchellum* (Reeve, 1844)

the West Indies; the first is a homonym of *Mitra minuta* Röding, 1798, and the second, described as a form, is not available according to Article 15 of the International Code of Zoological Nomenclature. Both, however, appear to be *Pusia*, and should be added to the list of names proposed for Caribbean *Pusia*, as should *Pusia splendidula* Sarasua, 1975, an apparent synonym of *V. (P.) variatum*, described from Cuba.

Photographic illustrations of type specimens of all but two of the previously mentioned species were examined for this study. Of the remaining two species, *Vexillum (Pusia) articulatum* (Reeve, 1845), described from an unknown locality, may or may not be a synonym of *V. (P.) albocinctum* (C. B. Adams) as proposed by Cernohorsky (1970). The type could not be located in the British Museum (Natural History). Reeve (1845) described the species from a specimen in the Norris collection; according to Dance (1966), some types from that collection went to the British Museum, but the remainder of the collection went to Tomlin, whose collection is now in the National Museum of Wales at Cardiff. Reeve's type may yet reside among this latter material. In any event, Reeve's illustration of *articulatum* (pl. 36, fig. 302) does not resemble our specimens. *Pusia bifasciata* Mörch, 1852 was not traced, but that name is a *nomen nudum* and a secondary homonym of *Mitra* [= *Vexillum*] *bifasciata* Swainson, 1821, so it is not available.

We also searched the major treatments of Reeve (1844–45) and Sowerby (1874) for other species described from unknown localities, but found none referable to the species at hand. We conclude, therefore, that the species has not been previously named.

Specimens of the new species are deposited in the molluscan collections of the British Museum (Natural History) [BM(NH)], London; the Academy of Natural Sciences of Philadelphia (ANSP), Pennsylvania; the American Museum of Natural History (AMNH), New York, New York; the National Museum of Natural History, Smithsonian Institution (USNM), Washington, D.C.; the Florida Department of Natural Resources Marine Research Laboratory (FSBC I), St. Petersburg, Florida, and the Redfern collection.

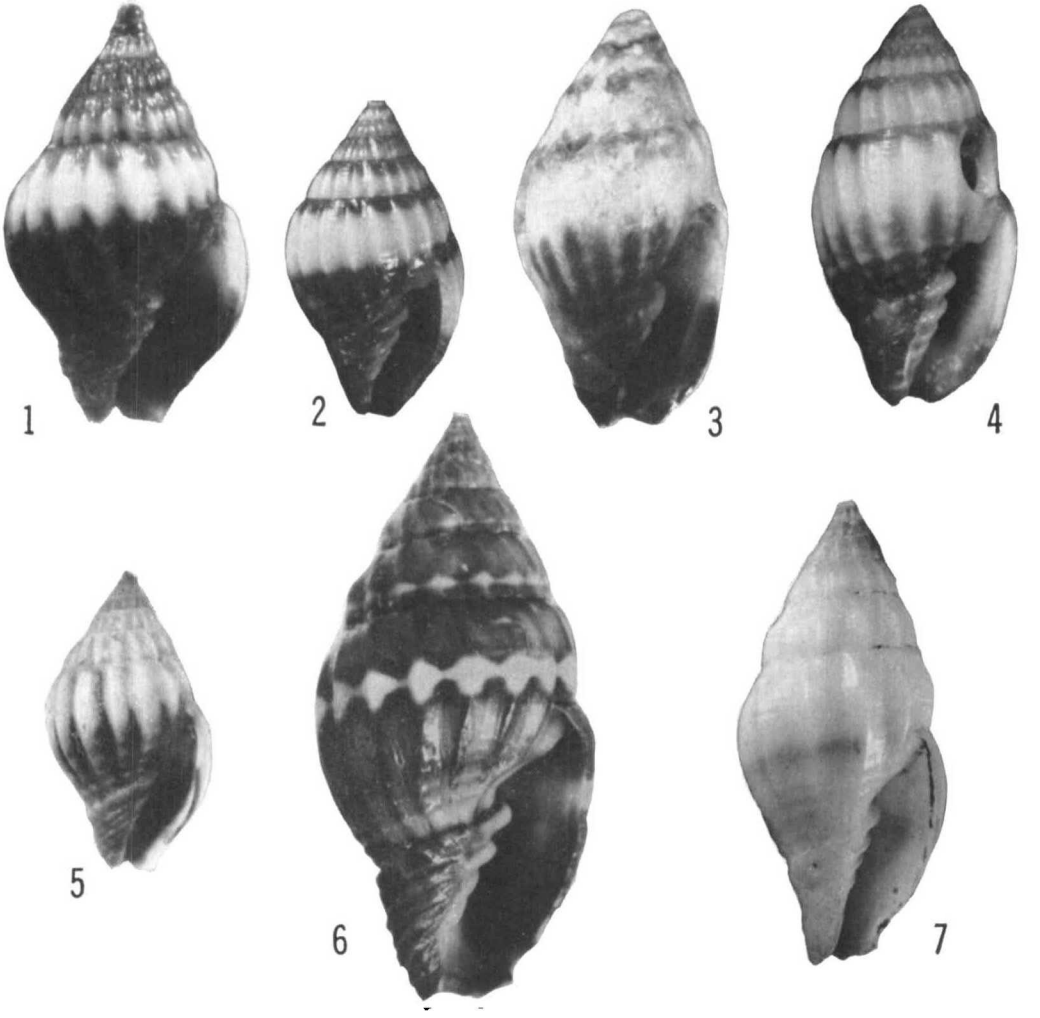
Vexillum (Pusia) chickcharneorum

new species

Figures 1–4

Holotype.—Length 10.5 mm; north side of Stocking Is., Gt. Exuma, Bahamas; 23–25 June 1974; USNM 758543.

Paratypes.—1 paratype, 8.1 mm; north side Stocking Is.; 23–25 June 1974; ANSP 345016.—2 paratypes, 7.3, 9.1 mm; same data; AMNH 183747.—2 paratypes, 8.4, 9.0 mm; same data; BM(NH) 1977165.—25 paratypes, to 9.9 mm; same data; FSBC I 17864.—1 paratype, 5.5 mm; northeast side Cat Is., Bahamas; 12 July 1976; USNM 758544.—2 paratypes, 6.8, 11.2 mm; same data; FSBC I 17866.



Figures 1–7. Caribbean *Vexillum (Pusia)*: 1, *Vexillum chickcharneorum* n. sp., juvenile paratype, 5.5 mm, Cat Is., USNM 758544 (× 10); 2, subadult paratype, 8.1 mm, Stocking Is., ANSP 345016 (× 5); 3, adult paratype, 11.2 mm, Cat Is., FSBC I 17866 (× 5); 4, adult holotype, 10.5 mm, Stocking Is., USNM 758543 (× 5); 5, immature *V. ?chickcharneorum*, 7.9 mm, Andros, FSBC I 17863 (× 5); 6, *V. albocinctum* (C. B. Adams), holotype, 15.0 mm, Jamaica, MCZ 177080 (× 5) [after Clench and Turner, 1950]; 7, *V. cubanum* Aguayo and Rehder, holotype, 12.0 mm, Cuba, USNM 420978 (× 5).

Other material.—1, 5.0 mm; east end Stocking Is.; 22 June 1974; FSBC I 17865.—1, 9.0 mm; Thurstone Bay, northeast of Treasure Cay, Gt. Abaco; 16 November 1974; Redfern collection.—4, 7.9–9.0 mm; Powell Cay and High Cay, Gt. Abaco; Redfern collection.

Description.—Shell small, to about 11.2 mm total length; mature specimens ovate in outline. Protoconch of two smooth, glassy, brown whorls. As many as six postembryonic whorls, each with nearly straight axial ribs crossed by 4–9 very faint spiral striae; ribs numbering 13–14, 16–18, 18–20, 18–

20, and 16–19 on first through fifth whorls; one shell with complete sixth whorl bearing 16 ribs. Aperture narrow, with thickened callus posteriorly and four, occasionally five, columellar plicae decreasing in strength anteriorly; a deep excavation between callus and plicae. Base and anterior dorsal surface of body whorl ornamented with four or five nodulose spiral cords of varying strength, followed anteriorly on base by about four oblique cords originating at columellar plicae. Outer lip curved throughout, with small crenulations indicating terminations of nodulose cords on anterior half. Living or freshly dead shells black, with very broad, well defined, white bands occupying most of each whorl of spire, nearly all of posterior half of body whorl; black color fading to rich chestnut brown on older shells.

Etymology.—We name the species for the Chickcharneys (or Chick Charneys), uniquely Bahamian inhabitants variously described by Voss and Voss (1960) as evil spirits or evil creatures, and by Kline (1974) as pixies, leprechauns, or gremlins. We suspect that these mischievous beings may have been responsible for the fact that the species has remained undiscovered until now.

Discussion.—We do not accept all synonyms for Caribbean *Pusia* proposed by Cernohorsky (1970). Although some synonyms undoubtedly exist, our examination of photographs of type specimens indicates that more careful attention to comparison of types is needed, particularly in the *exiguum-sykesimoisei*, *hanleyi-gemmatum-roseocaudatum*, and *histrio-albocinctum* complexes. Protoconch forms indicate taxa in the first complex may actually be assignable to the subgenus *Costellaria*. Consequently, we do not feel it propitious to provide a key to Caribbean *Pusia* until these problems have been resolved.

Spires on *Vexillum (Pusia) chickcharneorum* juveniles are sharply angled, with nearly straight sides (Fig. 1), becoming more expanded on fourth and fifth whorls; most of our specimens have 5–5½ whorls, range in length from about 7.0–9.0 mm, are quite globose (Fig. 2), and are apparently subadults. Only three specimens are sufficiently large (9.9–11.2 mm) to demonstrate the more elongate adult form. The most recently dead adult shell (Fig. 3) is heavily eroded on the spire by encrusting coralline algae, and a second specimen is badly abraded from surf rolling. The third shell, although drilled both dorsally and laterally by a muricid, best demonstrates the characters of the species and is selected as holotype (Fig. 4).

We examined one immature specimen which we doubtfully assign to *chickcharneorum*. The shell (length 7.9 mm; Fig. 5) has 5¼ whorls, with 12, 15, 16, 16, and 13 ribs on the first five, respectively. Rib counts are fewer on every whorl, but rib shape, and color and sculpture of the base are similar to those of *chickcharneorum*. The first four spiral whorls and posterior portion of the body whorl are completely white, in contrast to shells of *chickcharneorum* which otherwise always possess a dark band just anterior to the suture. The atypical specimen was collected alive from a crevice in living "fire coral" (*Millepora* sp.) on the barrier reef at Wax Cut, Andros, Bahamas (by WGL) in September 1971.

Vexillum (Pusia) chickcharneorum belongs to the group of small, solid, generally ovate *Vexillum* distinguished by spiral white bands or spots on black or very dark brown backgrounds. Indo-Pacific species in this group include *Vexillum (Pusia) cavea* (Reeve, 1844), *V. (P.) consanguineum* (Reeve, 1845), and *V. (P.) leucodesmum* (Reeve, 1845), all illustrated by Cernohorsky (1970). In the Caribbean, *V. (P.) histrio* is similar but is commonly larger (usually about 15 mm in length) and is much more ornately colored, bearing one or several orange spiral bands in addition to the single white band. Axial ribs of *V. (P.) histrio* are more broadly rounded than are those of the new species. *Vexillum (Pusia) puella* bears irregularly arranged white maculations of varying size on its black spire, and is further distinguished by possession of

many fine, closely arranged axial ribs. *Vexillum (Pusia) albocinctum* is perhaps nearest the new species, but differs by possessing only single white spots on the center or anterior portion of each rib; the spots are connected peripherally to form a narrow spiral band (Fig. 6).

Vexillum (Pusia) cubanum is somewhat similar to the new species in size, color, and shape. Aguayo and Rehder (1936) noted its color to be "white, with the lower half of the last whorl chestnut, or often paler, in which case there is a chestnut band at the upper margin of this zone; early whorls pinkish brown." The holotype (USNM 420978; Fig. 7) is apparently of the paler form. Compared to *V. (P.) chickcharneorum*, it is a more elongate, polished shell with more sharply defined columellar plicae continuing uninterruptedly onto the base where they resemble thin carinae. Nodulose cords on the base of *V. (P.) chickcharneorum* are absent on *V. (P.) cubanum*, which also lacks a strong callus within the posterior portion of the aperture. There are only 10–13 axial ribs on each whorl of *V. (P.) cubanum*, whereas *V. (P.) chickcharneorum* has 16 or more ribs on all except the first whorl. Size of *V. (P.) cubanum* (7+ whorls, length 12.2 mm; 6.5+ whorls, length 13.6 mm) is only slightly larger than that of mature *V. (P.) chickcharneorum.*

Krebs (1864) mentioned *Mitra* [= *Vexillum (Pusia)*] *semicostata* Anton from St. Martin, Netherlands Antilles, but did not report it later (Krebs, 1867) from the Bahamas. Reeve's figure (1845; pl. 37, sp. 308) of *semicostata* resembles *V. (P.) chickcharneorum* in banding and overall form, but both Reeve and Sowerby (1874) noted that the final whorl of *semicostata* is smooth, unlike the strongly ribbed final whorl of *V. (P.) chickcharneorum.* Although it is possible that early workers may have confused these two species, Coomans (1963) and Cernohorsky (1970) agree that *V. (P.) semicostatum* is properly assigned to the Indo-Pacific.

Species in the *Vexillum (Pusia) exiguum* complex are also banded, but they are slender, more elongate (usually to 15 mm or greater in length), and their white spiral bands are split by spiral incisions, creating two nodes on each axial rib. Species in the *hanleyi* complex are sometimes banded but are minute (usually less than 5 mm in length), strongly indented at each suture, and easily distinguished by possessing many sinuous axial lines adjacent anteriorly to sutures. *Vexillum (Pusia) epiphaneum* has entirely white spiral whorls, being dark only on the base and anterior portion of the body whorl, but resemblance to *V. (P.) chickcharneorum* is otherwise superficial; *V. (P.) epiphaneum* has a much more slender shell and attains a length of about 19 mm. This species and most other Caribbean *Pusia* discussed but not illustrated herein are figured in Abbott (1974).

Cernohorsky (1970) observed that *Pusia* species usually occur in reef habitats, where they may be found under stones or within cracks and crevices. All specimens of the new species were dead when collected. Most were found in depths of 1–5 m in accumulations of dead shells in holes and crevices of rocky platforms adjacent to seaward (windward) shores of small cays off Great Exuma and at Cat Island, two major islands in the eastern central Bahamas. Except for the Thurstone Bay specimen from an "inside" or mainland beach, all Abaco specimens are from oceanic beach drift at offshore cays. Associated mollusks also collected freshly dead from shell accumulations at Great Exuma and Cat Island include *Risomurex rosea* (Reeve, 1856), *Mitra barbadensis* (Gmelin, 1791), *M. nodulosa* (Gmelin, 1791), *Vexillum (Pusia) dermestinum*, *V. (P.) histrio*, *V. (P.) puella*, *Conus granulatus* Linné, 1758, and *C. regius* Gmelin, 1791, attesting to the reef-like character of the habitat. *Vexillum (Pusia) chickcharneorum* is probably also a member of that assemblage.

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